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TITLE: METHOD FOR MAKING A 3D EMBROIDERY

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METHOD FOR MAKING A 3D EMBROIDERY

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates to a production method for a three-dimensional embroidery with patterns of rich colors.

Description of the Prior Art

[0002] Previous production methods for an embroidery with three-dimensional patterns include the gradation method and the filler method.

[0003] The gradation method is a method whereby layers of embroidery threads are accumulated to a certain height to create a three-dimensional effect. However, this embroidery method requires large quantities of thread and a large amount of needlework to complete a pattern. Consequently, the production cost can be high.

[0004] The filler method is a method whereby three-dimensional materials, such as velvet, are cut into certain patterns and then sewn on embroideries. This method has been patented, namely in CN 1201088A and CN 1288984A. Although the patterns obtained have three-dimensional aspects, the use of fillers has led to manufacturing issues. Moreover, since the choice of color is limited, patterns with rich colors cannot be produced.

SUMMARY OF THE INVENTION

[0005] It is an object of the present invention to provide a production method for a three-dimensional embroidery of rich colors with simple manufacturing process and low cost.

[0006] It is another object of the present invention to provide a production method for a three-dimensional embroidery with both flat and three-dimensional patterns.

[0007] The present invention relates to a production method for a three-dimensional embroidery with patterns of rich colors.

[0008] According to an aspect of the invention, a production method for a three-dimensional embroidery includes the steps of (1) providing layers of fabric including a base layer, a top layer and an intermediary layer of a thickness; (2) embroidering a pattern through the layers of fabric with thread; (3) cutting the intermediary layer at a height to separate the top and base layers; and (4) removing the remaining intermediary layer from at least one of the top and base layers.

[0009] According to another aspect of the invention, the embroidery obtained may be further cleaned and dried, in order to obtain the finished embroidery.

[0010] According to a further aspect of the invention, prior to providing layers of fabric in step (1), flat embroidery may be performed either on the base layer alone or on both the base layer and top layer. Thereafter, when providing layers of fabric, the flat patterns that are embroidered on the base layer and top layer should overlap.

[0011] According to another aspect of the invention, prior to cutting the intermediary layer in step (3), thermal fusible film may be bonded onto the base layer and top layer by hot extrusion to secure the fabric and bottom threads, and to make it possible to obtain complete patterns without detached threads when removing the intermediary in step (4). In other words, hot extrusion makes it possible to simultaneously obtain two pieces of embroidery with mutually symmetrical patterns. If a flat pattern is embroidered on the base layer only, then a complete pattern with both a flat pattern and a three-dimensional pattern is available on the base layer only.

[0012] According to a further aspect of the invention, prior to removing the remaining intermediary layer in step (4), thermal fusible film may be bonded onto the base layer and top layer by hot extrusion to secure the fabric and bottom threads and to make it possible to obtain complete patterns without detached threads. Hot extrusion makes it possible to simultaneously obtain two pieces of embroidery with mutually symmetrical patterns.

[0013] According to another aspect of the invention, thermal plastic epoxies such as polyamide, polyester and polyurethane may be used as thermal fusible film. Thermal plastic films made of polyamide are most commonly used.

However, when polyester fabrics are used as top or base layer, thermal plastic films made of polyester are used. Furthermore, when flexibility is given weight, thermal plastic films made of polyurethane are preferred. Specific examples of thermal fusible films include: Nylon – 610, polyethylene terephthalate, polybutylene terephthalate, and polynaphthalene terephthalate.

[0014] According to a further aspect of the invention, materials commonly used in the past, such as polyester yarn and cotton yarn, may be used as threads. Thermal fusible yarn or mixed yarn of two different threads may also be used. However, when thermal fusible yarn is used, the thermal fusible film described above does not have to be used. Specific examples of threads with good thermal fusibility include: polypropylene (such as ELCHEL®) and polyester. In addition, if mixed wool and silk is used as fabric thread, there may be a curling effect after washing, and a sense of novelty may be generated.

[0015] According to another aspect of the invention, foamed polyurethane, foamed ethylene/acetate ethylene polymers or felt may be used as intermediary layer. Materials soluble in solvent or water (hot water) may also be used, and the top and base layer may be cut off after the intermediary layer is dissolved, to obtain embroidery with three-dimensional patterns. A specific example of intermediary materials soluble in solvent is diacetate fabric soluble in acetone. A specific example of intermediary materials soluble in water is polyvinyl alcohol fiber non-woven fabric.

[0016] Based on the embroidery method in this invention, embroidery with three-dimensional patterns or a combination of flat and three-dimensional patterns can be obtained. Moreover, the manufacturing process for such embroidery is simple, convenient, and with a relatively low manufacturing cost.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] Figure 1 is a front view of the layers of fabric.

[0018] Figure 2 is a front view of the layers of fabric with a three-dimensional pattern embroidered.

[0019] Figure 3 is a front view of the layers of fabric with a three-dimensional pattern embroidered, thermal fusible films bonded on the base and top layer, and having dissection line A.

[0020] Figure 4 is a front view of the finished three-dimensional embroidery with thermal fusible films bonded on the base and top layer.

[0021] Figure 5 is a front view of the base layer with a flat pattern embroidered.

[0022] Figure 6 is a front view of the layers of fabric with a flat pattern embroidered on the base layer.

[0023] Figure 7 is a front view of the layers of fabric with a three-dimensional pattern embroidered and a flat pattern embroidered on the base layer.

[0024] Figure 8 is a front view of the layers of fabric with a three-dimensional pattern embroidered, a flat pattern embroidered on the base layer, thermal fusible films bonded on the base and top layer, and having dissection line A.

[0025] Figure 9 is a front view of the finished three-dimensional embroidery, with a flat pattern embroidered on the base layer and thermal fusible films bonded on the base layer.

DETAILED DESCRIPTION OF THE DRAWINGS AND PREFERRED EMBODIMENTS

[0026] A method for making a three-dimensional embroidery includes four steps, as shown in Figures 1-4. In step (1), place intermediary layer 2 and top layer 3 sequentially on base layer 1, as shown in Figure 1. In step (2), use fabric threads 4 and an embroidery machine (not shown) to embroider a pattern through the base layer 1, the intermediary layer 2 and the top layer 3, as shown in Figure 2. The specific embroidery process in this invention is identical to flat embroidery. Therefore, issues on the input of its patterns, value calculation and embroidery machine output are related to existing technologies and will not be discussed here. In step (3), cut the intermediary layer 2 along line A using a cutting knife 8, as shown in Figure 3. Cutting line A is located at a height in the intermediary layer 2, preferably closer to the top layer 3. In step (4), remove the portions of

intermediary layer 2 that are remaining on the base layer 1 and top layer 3, as shown in Figure 4. At this time, two pieces of embroidery with mutually symmetrical three-dimensional patterns are obtained. The three-dimensional patterns on base layer 1 and top layer 3 are mutually symmetrical.

[0027] Moreover, prior to cutting intermediary 2 in step (3), depending on the types of materials used for the intermediary layer 2 and fabric thread 4, thermal fusible films 6 and 7 may be bonded to top layer 3 and base layer 1, respectively, to secure fabric thread 4 and bottom thread 5 and to ensure smooth cutting, as shown in Figure 3. Specifically, through hot extrusion, upper thermal fusible film 6 is heated to a temperature above its melting point and bonded to top layer 3. At the same time, lower thermal fusible film 7 is also heated to a temperature above its melting point and bonded to base layer 1. Thereafter, proceed to complete the embroidery as described in steps (3)-(4) above. By bonding thermal fusible films 6 and 7 to top layer 3 and base layer 1, respectively, prior to cutting the intermediary layer 2 in step (3), a complete, three-dimensional embroidery without any detached part can be obtained, as shown in Figure 4. Thermal fusible films 6 and 7 may also be bonded to top layer 3 and base layer 1, respectively, to secure fabric thread 4 and bottom thread 5, prior to removing the intermediary layer 2 in step (4), to obtain complete patterns without detached threads.

[0028] Furthermore, prior to placing intermediary layer 2 and top layer 3 sequentially on base layer 1 as described in step (1), a flat pattern 9 may be first embroidered on the base layer 1, as shown in Figure 5. Thereafter, proceed to complete the embroidery as described in steps (1)-(4) above, as shown in Figures 6-9. At this time, the three-dimensional pattern 4 and the flat pattern 9 have been embroidered on the base layer 1, as shown in Figure 9. By embroidering a flat pattern 9 on the base layer 1 prior to providing layers of fabric in step (1), embroidery with simultaneous two styles of patterns, i.e., flat pattern 9 and three-dimensional pattern 4, may be obtained.

[0029] Further explanation is given below based on the specific examples, but this invention is not limited to the specific examples given.

SPECIFIC EXAMPLES

Example 1

[0030] Sequentially place a polyamide liner cloth to be used as base layer, a foamed ethylene/acetate ethylene polymer layer to be used as intermediary layer, and a polyamide liner cloth to be used as top layer. Then, place the layers of fabric on an embroidery machine and perform embroidery based on a pre-designed pattern, using polyacrylonitrile fiber as fabric thread and cotton yarn as bottom thread. Thereafter, heat the embroidered layers of fabric to 150°C. Then, use a cutting knife to dissect the foamed ethylene/acetate ethylene polymer intermediary layer into two pieces along the side closer to the top layer. Finally, remove the foamed ethylene/acetate ethylene polymer intermediary layer remaining on the plain polyamide liner cloth and a three-dimensional embroidery is obtained.

Example 2

[0031] Same as Example 1, except in this example, a thermal fusible film made of polyamide is bonded onto the top layer and base layer prior to cutting the intermediary layer. When bonding the polyamide thermal fusible film onto the top layer and base layer, it is heated to 150 °C, and the pressure is exerted at 0.3 kg/cm^2 for 10 seconds.

Example 3

[0032] Same as Example 1, except in this example, a flat pattern is embroidered on the base layer prior to placing the intermediary layer and the top layer. After the embroidery is produced, there are both the flat pattern and the three-dimensional pattern embroidered on the base layer. Whereas on the top layer, there is only the three-dimensional pattern embroidered.